

METHOD AND APPARATUS FOR COMPOSING VIRTUAL LINKS IN A LABEL SWITCHED NETWORK

ABSTRACT OF THE DISCLOSURE

A method for managing virtual links within a multiple protocol label switched network is provided. According to one aspect of the method, a virtual link which is made up of a set of links between two devices within the multiple protocol label switched network is regarded as a single entity by a control component of a label switching router. Each packet to be transported on the virtual link is labeled based on its assigned forwarding equivalence class. A specific label is bound to a corresponding forwarding equivalence class. The specific label are used on packets belonging to the same forwarding equivalence class and such packets can then be forwarded onto any one of the links within the virtual link. Furthermore, according to another exemplary aspect of the method, each forwarding equivalence class can be mapped to one of the links within an outgoing virtual link without changing the output label. This mapping is performed using a selected hash function. The selected hash function is used to map the labels to integers to get a distribution on a smaller set of links in the virtual link. In addition, according to a further exemplary aspect of the method, packets with different labels are apportioned among links within the virtual link. Packets with the same label (hence the same forwarding equivalence class) are forwarded onto the same link within the virtual link. In order to load balance the various links within the virtual link, different selected hash functions can be used at selected times to apportion the packets depending on the load conditions. Finally, according to yet another exemplary aspect of the method, respective hash functions used at the sending and receiving label switching routers are synchronized. By synchronizing the hash functions, the number of entries in the load forwarding tables are reduced thereby reducing search time and memory storage requirements.

SF 1294999 v1